CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER 94 - 070
AMENDED WASTE DISCHARGE REQUIREMENTS

EXXON COMPANY, U.S.A.,
3400 EAST SECOND ST.,
CITY OF BENICIA
SOLANO COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board) finds that:

1. Facility Location. Exxon Company U.S.A., (hereinafter called the Discharger), owns and operates a petroleum refinery, (hereinafter called the facility), located in the City of Benicia, Solano County.

2. Facility Operation The Facility, which began operation in 1969, manufactures hydrocarbon products, byproducts and intermediaries and is classified as a cracking refinery as defined by U.S Environmental Protection Agency pursuant to 40 CFR 419.20. Approximate daily crude throughput consist of about 135,000 barrels of oil per day.

3. Facility Wastewater Discharge The Facility discharges about 2.5 million gallons per day (MGD) of treated process wastewater into Carquinez Strait. The discharge is currently regulated by Board Order No. 90 - 096, NPDES Permit No. CA0005550, adopted June 20, 1990. The process waste water and contaminated stormwater runoff are treated at the on-site wastewater treatment plant.

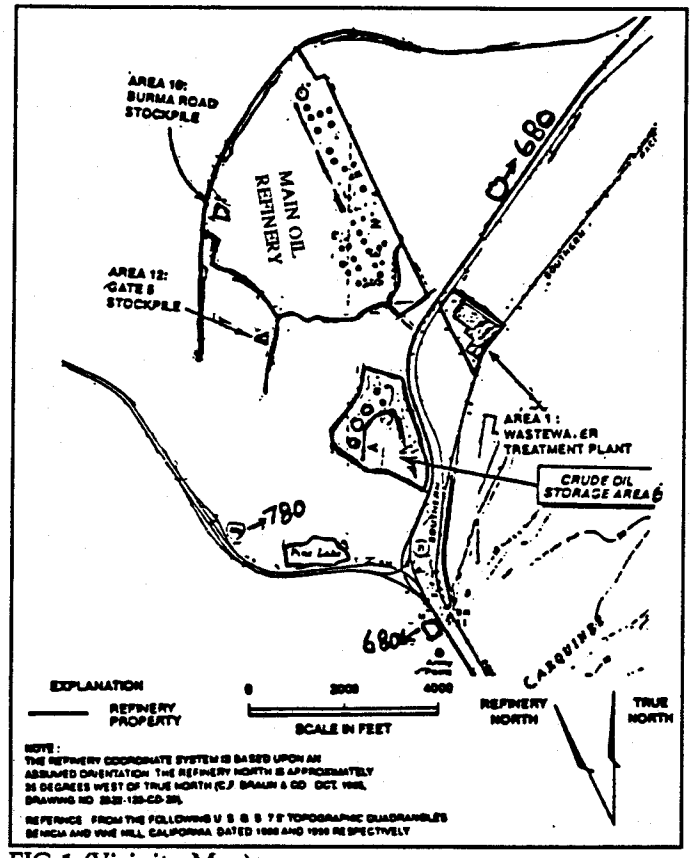


FIG 1 (Vicinity Map)

4. Purpose of Order. The purpose of this order is to add to the requirements of Order 91 - 094 and do not supersede Order 91 - 094. This order focuses on the waste management units (WMU) contained in the facility.

5. Facility Description. The three operating sites as indicated in Figure 1 above includes:

   a. The crude oil storage area (COSA);

b. The wastewater treatment plant site (WWTP) and;

c. The main Refinery site.

6. WMU Locations. The discharger divided the three operating sites of the facility into 13 areas for the purposes of the on going facility wide soil and groundwater investigations. The history of spills at some of these areas are discussed in this Order. However, this Order focuses on waste management units (WMU) structures contained in some of the areas which including:

a. Area 1, which contains three wastewater treatment ponds coincides with the location of the wastewater treatment plant (WWTP). Area 1 is bounded to the west by Sulphur Spring Creek, Interstate 680 to the north, Industrial Parkway to the east and Southern Pacific rail road to the south.

b. Area 6, which contains 3 surface impoundments, six above ground tanks, a crude transfer pad, biosludge and tank-sludge stockpiles coincides with the location of the crude oil storage area (COSA). Area 6 is bounded to the west by Park Road, Interstate 680 to east, Huntway Refinery and Park Road to the north. The on site facility spreading of sludge was a prevalent industrial practice prior to 1980. However the Discharger indicates that the disposal of the sludges was a one time incident.

c. Area 10, which contains the Burma Road stockpile is located within the northwestern portion of the main refinery. East Second Street lies directly to the north, while Burma Road is to the south of area 10.

d. Area 12 which contains the Gate 5 soil stock pile lies directly out side the fence line to the south west of the main refinery.

AREA 1 (WWTP PONDS)

7. Site History (WWTP - Area 1). Area 1 is located in a former marshland reclaimed in the 1960s by placement of fill material. Three ponds, (the equalization, retention and final ponds) lie in the eastern portion of Area 1. The past and present use of the ponds are as follows:

a. In the past, sour water from Exxon's chemical sewer was discharged into the equalization ponds. The sour stream from the equalization pond flows into the Bioxidation (Biox) basin for biological treatment. Primarily oily process water, process water and stormwater collect into the API sewer at various points in the refinery. Stream from the API sewer is passes through the API separator, Dissolved Air Flotation Tank (DAF) and then discharges into the retention pond. In addition, excess stream from the chemical sewer may be discharged directly to the retention pond. The waste water stream from the retention pond is discharged to the BIOX basin for biological treatment. The stream from the Biox basin is discharges into the concrete clarification basins which over flows into the final pond. Treated waste stream from the final pond which meets its NPDES permits may be discharged to Sulphur Spring Creek/Slough. When monitoring of effluent from the pond indicates that quality is unsatisfactory or do not meet its NPDES permit requirements, the effluent may be discharged to the crude field storage ponds in Area 6 for further treatment.

b. With the 1991 installation of a new primary treatment system, Exxon no longer discharges dry weather flows to the retention pond and equalization pond. Currently

oily process water, process water and storm water from the API sewer bypass the retention pond and are discharged directly to BIOX basin through two diversion tanks. Sour water is now by passing the equalization ponds and discharges directly to the BIOX basin. However, during heavy rain storm events, industrial storm water and process water from the API sewer can be diverted to the retention pond and the equalization pond as needed. In 1993, the discharger had cause to discharge to these ponds on several occasions. Following rain events the discharger indicates that the first flush from the API sewer is always captured in the diversion tank and the diverted water in the ponds is treated promptly to prepare for another storm event. The direct discharge of the oily process water and sour water to the ponds is still potentially possible although the pipelines that made previous direct connection to the ponds have been closed off but continues to exist.

8. **Waste Management unit Changes (WWTP - Area 1):** In 1993 the discharger completed the process of sludge removal from the final pond and reconstructed the boundaries of the final and retention ponds. Effectively, the capacity of the retention pond was increased at the expense (reduction of size) of the final pond. The new dimension of the ponds after 1993 as compared to the older dimensions (prior to 1993) is as listed in the attached table 1. For the purpose of this Order (including Finding 7 of this Order), all descriptions and references to the ponds are based on the prior to 1993 dimensions. Following the retrofitting of the ponds, this Order may be revised to include the current dimensions.

9. Waste Management Unit Descriptions (WWTP - Area 1): The impoundments cover about three quarters of Area 1. The discharger indicates that the ponds were constructed by excavating the fill material in place such that the bottom of the ponds are now in contact with the natural soft marsh soil. The earth perimeter dikes range from 15 to 20 feet wide at the top and 35 to 40 feet at the base, with a dike slope of about 1.5:1 (horizontal :vertical). Impoundment depths ranged from 4.49 feet - 4.69 feet. The descriptions of individual impoundments are as follows:

   a. The retention pond has a rectangular shape and lies between the equalization and final ponds in Area 1. The capacity of the pond is about 11.35 million gallons. Top surface area is about 7.56 acres.

   b. The equalization pond has a rectangular shape and lies to the north of Area 1. The pond has a capacity of about 1.53 million gallons and a top surface area of about 1.3 acres.

   c. The final pond has an "L" shape and, lies bayward to the south of Area 1. The pond has a capacity of 2.49 million gallons and a top surface area of about 1.7 acres.

10. Impoundment Sludge (WWTP - Area 1): In a draft report[3] entitled "Waste Water Treatment Pond Characterization" the discharger documented the results of the characterization of pond water and sludge/sediments. The discharger collected and analyzed sediment and water samples, estimated sludge thickness and total volume. Following the characterization, the discharger indicates that the ponds have been dredged. The results of the characterization are summarized as follows:

   a. Equalization Ponds; Samples were collected from two locations in the equalization pond. Sludge thickness ranged from 3.8 feet to 5.8 feet and water depth in the same locations ranged from 17 inches to 2.5 inches. Discharger's estimated average volume of

sediments is about 5,600 cubic yards. The of chemical analysis are summarized as follows;

i. Metal analysis of sediment samples indicated the presence of barium, cadmium, cobalt, copper, molybdenum, nickel and zinc above detection levels. Concentrations of metal detected ranged from 89.8 mg/kg to 861 mg/kg of chromium, <0.2mg/kg to 1.6 mg/kg of beryllium, 0.32 mg/kg to 0.584 mg/kg of mercury, 4.3 mg/kg to 6.7 mg/kg of lead and 18.6 mg/kg to 166 mg/kg of vanadium. Concentrations of purgeable organics in sediment samples ranged from 16,000 ug/kg to 24,000 ug/kg of benzene, 40,000 ug/kg to 47,000 ug/kg of ethylbenzene, 36,000 ug/kg to 47,000 ug/kg of toluene and 19,000 ug/kg to 56,000 ug/kg of xylene. Sludge samples also indicated the presence of semivolatile organics at concentration ranges of 540 mg/kg to 840 mg/kg for benzidine, 26 mg/kg to 41 mg/kg for phenanthrene, 36 mg/kg to 87 mg/kg for naphthalene and 110 mg/kg to 170 mg/kg for 2 - methyl -naphthalene

ii. Pond water from sediment sample locations indicated the presence of metals including barium, mercury, chromium, nickel, selenium, vanadium and zinc. Chromium, mercury and selenium exceeded their maximum contaminant levels concentration. Water samples from the retention and equalization ponds were not differentiated.

b. Retention Pond; Samples were collected from six locations in the retention pond. Sludge thickness ranged from 2.4 feet to 5.5 feet and water depth in the same locations ranged from 21 inches to 12.5 inches. Discharger's estimated average volume of sediments is about 15,250 cubic yards. Summary of chemical analyses are as follows;

i. Metal analysis of sediment samples indicated the presence of barium, cadmium, cobalt, copper, molybdenum, nickel and zinc above detection levels. Concentration of metal detected ranged from 176 mg/kg to 1,010 mg/kg of chromium, <0.2mg/kg to 1.8 mg/kg of beryllium, 0.25 mg/kg to 0.478 mg/kg of mercury, 2.3 mg/kg to 5.8 mg/kg of lead and 20 mg/kg to 186 mg/kg of vanadium. Concentrations of purgeable organics in sediment samples ranged from 10,000 ug/kg to 13,000 ug/kg of benzene, 13,000 ug/kg to 19,000 ug/kg of ethylbenzene, <25 ug/kg to 43,000 ug/kg of toluene and 400 ug/kg to 25,000 ug/kg of xylene. Sludge samples also indicated the presence of semivolatile organics at concentration ranges of 400 mg/kg to 1100 mg/kg for benzidine, 28 mg/kg to 65 mg/kg for phenanthrene, 33 mg/kg and 190 mg/kg for naphthalene and 130 mg/kg to 270 mg/kg for 2 - methyl -naphthalene.

ii. Pond water from sediment sample locations indicated the presence of metals including barium, mercury, chromium, nickel, selenium, vanadium and zinc. Chromium, mercury and selenium exceeded their maximum contaminant levels concentration. Water samples from the retention and equalization ponds were not differentiated.

c. Final Pond; Samples were collected from six locations in the final pond. Sludge thickness ranged from 2.5 feet to 4.8 feet and water thickness in the same locations ranged from 4.5 inches to 22.5 inches. Discharger's estimated average volume of sediments is about 31,100 cubic yards. Summary of chemical analysis are as follows;

i. Metal analysis of sediment samples indicated the presence of barium, cadmium, cobalt, copper, molybdenum, thallium, nickel and zinc above detection levels. Concentration of bio-accumulative metal detected ranged from 15.3 mg/kg to 408 mg/kg of chromium, 0.07 mg/kg to 2.59 mg/kg of beryllium, 0.26 mg/kg to 0.746 mg/kg of mercury, 1.2 mg/kg to 5.1 mg/kg of lead and 7.23 mg/kg to 271 mg/kg of vanadium. Concentrations of purgeable organics in sediment samples ranged from 11 ug/kg to 28 ug/kg of benzene, <25 ug/kg to 43 ug/kg of ethylbenzene, 25 ug/kg to 169 ug/kg of toluene and 4.3 ug/kg to 260 ug/kg of xylene. Sludge samples also indicated the presence of semi-volatile organic compounds including 2,4 dimethylphenol, phenol, benzo-a-prene, benzidine, chrysene, fluorene-naphthalene, phenanthrene, 2-methyl-naphthalene, and 4 methyl phenol.

ii. Pond water from sediment sample locations indicated the presence metals including barium, chromium, mercury, selenium, vanadium and zinc. Chromium and selenium exceeded their maximum contaminant level concentrations.

11. Geology / Hydrogeology (WWTP - Area 1) According to the report[1], The Refinery over lies the Mesozoic - age sedimentary and igneous rocks of the Franciscan assemblage, which have been deformed by a series of folding and faulting. This folding and faulting has produced complex geologic lithology consisting of shale, sandstone, chert and volcanic rocks. A summary of local stratigraphy and hydrogeology are as follows:

a. The report[2], indicates that the ponds were constructed by placing several feet of gravelly and sandy clay fill on top of the native material (identified as bay mud and organic peat material) and, then excavated to the top of the native material. The report indicates that native material consists of dark brown silty clay with sand, gravel, roots, marine shell fragments and up to 50% peat content. Thickness ranges from 25 feet to 80 feet below ground surface. The native material is underlain by the alluvial, colluvial and stiffer blue gray silty clay with occasional sand content identified as older bay mud. The Older bay mud ranges from 8 feet to 25 feet in thickness. The older bay mud is underlain by discontinuous layers silty sand / gravelly clay and silty clay, which is encountered at depths of 75 feet below ground surface. The native bay mud may be the dominant material underlying the pond, however its homogeneity is questionable and this may affect the ability of the native material to provide a natural geologic barrier.

b. The report indicates the presence of two groundwater bodies. The unconfined shallow groundwater with potentiometric levels of 2 feet to 5 feet msl is susceptible to seasonal and pond water level influences. Shallow groundwater flow direction and gradient in the vicinity of the ponds is not clearly defined, due perhaps to ponded water influences. However, it is suspected that regional flow is generally in the direction of Sulphur Spring Creek and Carquinez Strait(Bay). The deeper groundwater body is encountered at 75 feet to 100 feet below ground surface and within the silty clay sand/ gravel zone. Slug test in the shallow wells (< 15 feet depth) indicate hydraulic conductivity in the range of 2.80×10^{-6} cm/sec to 1.73×10^{-3} cm/sec. Slug test in an intermediate well screened between 40 feet and 50 feet bgs indicated a hydraulic conductivity of 1.97×10^{-02}. Slug test in wells screened in the deeper water zone indicated a hydraulic conductivity of 2.62×10^{-2} cm/sec. Laboratory tests on the younger bay mud indicated a permeability range of 1.79×10^{-8} cm/sec to 2.17×10^{-7} cm/sec. Chapter

15 requires that field hydraulic conductivity below 10^{-6} cm/sec. must be confirmed in the native soil to assume a natural geologic barrier. The range here falls below and above the mark, which is typical of native non homogenous soil. The underlying material is therefore not capable of providing a natural geologic barrier.

12. Tidal Influence (WWTP - Area 1); To conduct a tidal influence study in Area 1, the discharger installed transducers in the ponds, Sulphur Spring Creek and in about 10 monitoring wells within Area 1. Monitoring wells screened in the deeper water bearing zones indicated tidal loading. This suggests a hydraulic connection between the Creek, Carquinez Strait and the deeper ground water. The discharger indicates that the tidal loading observed in the shallow monitoring wells and the ponds may be due to anisotropy and non-homogeneity of subsurface conditions. The probable effect of water mounding in the final pond may have contributed to distortion of results. Diurnal fluctuations was observed in the final pond and should be expected due to diurnal sea level fluctuations. The discharger suggests that other factors such as wind and temperature may be contributing to the diurnal fluctuation. In general, the low tidal loading indicates mild hydraulic connection of the ponds to the waters of the State.

13. Groundwater Contamination (Area 1) Groundwater samples from monitoring wells installed in the vicinity of the ponds have been analyzed for contaminants and results were documented in two technical reports[1,2]. There are no groundwater wells directly below the ponds, but the ponds bottom is known to lye on or below the water table. Contaminant concentrations in dredged sludge, sediments, soil samples beneath the ponds and pond water (table 4-3 of report[2]) indicates that ponds have contributed to the degradation of groundwater in the area. The following are the summary of contaminant concentrations from the monitoring wells in the vicinity of the ponds as documented in the reports:

a. In the report[2], volatile organics detected include 2-butanone, toluene, and tetrahydrofuran. Concentrations of 2-butanone in both the deep and shallow groundwater zones ranged from less than 0.02 mg/L to 0.890 mg/L. Semi volatile organics detected include propane, alkene and dimethylethyl phenol. CAM metals detected include barium, chromium, copper, nickel and zinc. Concentrations of barium ranged from 0.38 mg/L to 2.7 mg/L.

b. The report[1], documented the detection of volatile and semi volatile organic compounds, as well the presence of metals in the vicinity of Area 1. Samples from Well 101, indicated the highest concentrations of TPH as gasoline and diesel upto 47 mg/l and, Benzene, toluene, ethyl benzene and xylene upto 11 mg/l. The discharger suggests that the contaminants in Well 101 may come from other sources including the adjacent area of former waste water sludge handling practices. For the rest of the monitoring wells sampled, total petroleum hydrocarbons concentrations measured as gasoline, diesel and oil ranged from less than detection limits to 1.3 mg/L for water samples from both deep and shallow wells. Benzene, ethyl benzene, toluene and xylene concentrations detected in most of the shallow and in some deep wells ranged from less than detection limit to 0.0064 mg/L. Other semi volatile organic compounds detected include acetone, trichloro-ethane, carbon disulfide and dichloro-ethene.

c. As documented by the report[1], most of the CAM metals were detected in groundwater samples. Maximum concentrations of antimony is up to 0.011 mg/L, Barium up to 4.0 mg/L, chromium up to 0.8 mg/L, nickel up to 0.26 mg/L, selenium up to 0.01 mg/L. These maximum concentrations are higher than California's water quality objectives as indicated in Drinking Water Standards (MCL), Inland Surface Water Plan or Enclosed

Bays & Estuaries Plan.

d. The discharger conducted aquatic bioassays with groundwater samples from six monitoring wells (101, 117, 125, 126, 127, 128). Testing consisted of short term chronic bioassay on mysid shrimp. All well groundwater samples exhibited very high chronic toxicity to the mysid shrimp. Lowest no observable effect level (NOEL) was 5% in a groundwater sample from monitoring well 117. Highest NOEL was 50% in a groundwater sample from shallow monitoring well 126. The discharger indicates that the cause and source of toxicity could not be predicted from the test. In addition to ammonia present in groundwater, other substances present at levels exceeding California Ocean Plan limiting concentration includes arsenic, cadmium, chromium, copper, lead, mercury,nickel and zinc.

14. Soil Contamination (Area 1 - WWTP); Soil samples from installed monitoring wells have been chemically analyzed for contaminants and results were documented in two technical reports[1,2]. The pond operation has caused degradation of the soil beneath and may have contributed to degradation beyond the ponds. The following are the summary of contaminant concentrations in the reports:

a. In the report[2], volatile organics detected beneath the ponds includes 2-butanone, toluene, xylene, methylene chloride, carbon disulfide, benzene, ethylbenzene and acetone. Concentrations of acetone ranged from 0.037 mg/kg to 0.36 mg/kg, xylene ranged from 0.019 mg/kg to 0.055 mg/kg. The analysis did not include total petroleum hydrocarbon in the soil. Concentrations of metals detected range from 140 mg/kg to 250 mg/kg of barium, 1.9 mg/kg to 13 mg/kg of arsenic, 9.1 mg/kg to 47 mg/kg of chromium, 8 mg/kg to 53 mg/kg of nickel and 6.2 mg/kg to 30 mg/kg of lead. Organic and metal contaminants were also detected in the borings surrounding the ponds. The discharger has indicated that sources other than the pond alone may have contributed to the soil and groundwater contamination.

b. The report[1], documented the detection of volatile and semi-volatile organic compounds, as well as the presence of metals in the soil. Total Petroleum Hydrocarbons concentrations as gasoline, oil and diesel ranged from less than detection limits to 1500 mg/kg for soil samples from both deep and shallow borings. Organics (ethyl benzene, toluene and xylene), were detected in most of the shallow and in some deep borings in concentrations ranging from less than detection limit to 6 mg/kg for ethylbenzene, up to 3 mg/kg of toluene and up to 45 mg/kg of xylene. Other organic compounds at levels above detection limit included dichloro-ethane, trichloro-ethane, acetone, benzene, carbon disulfide and dichloro-ethene.

c. As documented by the report[1], metals were detected in soil samples beneath and surrounding the waste treatment ponds. Metal concentrations present in the soil includes arsenic up to 13 mg/kg, barium up to 720 mg/kg, chromium up to 62 mg/kg, copper 75 mg/kg, lead up to 15 mg/kg, mercury up to 1.6, nickel up to 59 mg/kg, vanadium up to 150 mg/kg.

15. Remedial Alternative, (Area 1 - WWTP Ponds); In the report[2], the discharger concluded that strict compliance with Chapter 15 prescriptive standards is unreasonable and unnecessarily burdensome. Chapter 15, however allows for engineered alternative in such cases of burdensome compliance. Some of the ponds may qualify for exemptions or could be retrofitted through an engineered alternative as follows:

a. The Discharger indicates that the final Pond received treated waste water. However, contaminants have been detected in the sediments and soil beneath the pond, and groundwater at perimeter of the pond. Storage of treated effluent may qualify for exemption from the provisions of Chapter 15. The final pond is identified as a waste management unit. Additional information including pond bottom investigations and influent to the pond is required to enable classification or exemption of the pond. Following classification the discharger shall be required to propose remedial measures, which at minimum, will require cleanup or containment measures.

b. In the past the Retention Pond was used to store untreated oily and process waste water, and storm water, which has impacted the soil and groundwater. The pond could still contain untreated process waste water and industrial storm water, especially during rainy seasons, when flow exceeds the treatment and storage capacity of the plant. Continued exposure of the soil and groundwater beneath the pond may increase the mobilization of contaminants. The impoundment must be retrofitted to meet the Chapter 15 requirements.

c. In the past the Equalization Pond was used to store untreated waste water and storm water, which has impacted the soil and groundwater. The pond could still contain untreated process waste water and industrial storm water, especially during rainy seasons, when waste water and storm water stream flow exceeds the storage and treatment capacity of the plant. Continued exposure of the soil and groundwater beneath the pond may increase the mobilization of contaminants. The impoundment must be retrofitted to meet chapter 15 requirements.

16. Stability of ponds (Area 1 - WWTP Ponds) - According to the report[1], active seismic faults within 100 km of the ponds includes the San Andreas, Hayward, Concord - Green Valley, Calaveras, Greenville-Marsh Creek, Vaca-Antioch, Palo Colorado-San Gregorio and Maacama faults. The concord - green valley fault system is closest from the site (2 km from site), has an approximate maximum credible earthquake (MCE) of 7.0 Richter magnitude and this MCE was used to model the deformation of the site under seismic event. Two stratigraphic profiles were considered. One profile was assumed to have 30 feet of bay mud over 5 to 25 feet of alluvium underlain by 35 to 105 feet of bedrock. The other profile included 80 feet of bay mud over ranges of alluvium and underlain by bedrock. A dynamic computer aided analysis of pond slope deformation predicted 2 feet to 3 feet lateral displacement and about 18 inches of vertical drop in the event of an MCE of 7.0 Richter magnitude. The shall ensure that the waste management unit are stable enough to contain the waste in the event of these seismic event.

17. Waste Management Unit Classification (Area 1 - WWTP Ponds) - The Board has determined that the retention, final and equalization ponds contained and may still contain designated waste and substance in soil and groundwater listed in the Title 22 of HSC). These ponds are identified as chapter 15 ponds. Discharger indicates that sludges were recently removed the from all three ponds (impoundments). Pursuant to Chapter 15, the ponds should be classified and then retrofitted. However, further information will be needed to complete review and classification these ponds.

AREA 6 (COSA POND)

18. Site History:(COSA - Area 6). Area 6 covers about 14 acres and is located in a former hill side and ravine which has been cut and filled respectively. Three ponds, (Lake Lund, Lake Lee and Lake Spalding) lie in the south-eastern portion of Area 6. The past and present use of the

ponds are as follows:

a. Lakes Lund and Lee receive treated effluent from WWTP final pond when the NPDES effluent standards are not met or quality is unsatisfactory. After further analysis, the contents of the pond is either pumped back to the treatment system for recirculation or discharged in to Carquinez Strait through out fall 001. The smallest pond (Lake Spalding) is used to store refinery fire fighting water.

b. Three waste disposal sites are identified within Area 6 as follows:

   i. In 1972, five cubic yards of tank bottom sludge stockpile was deposited in the south-western border of area 6. The stock pile is said to contain trace amounts of lead. Although the stockpile lies within Lake Lund, the discharger indicates that it was demarcated with an earthen berm and capped with soil.

   ii. In 1974, 10, 000 cubic yards of pond bottom sediments (biosludge) from the WWTP retention and final ponds was spread on top of surface soil in Lake Lund. The place of disposal, now the middle portion of Lake Lund occupies about 3 acre.

   iii. After the 21,000 gallon crude oil spill from tank 1704, the discharger indicates that the impacted soil was excavated and treated. The treated soil was then returned to the area and used in tank 1704 berm as liner.

19. Spill History(COSA - Area 6). Many releases have occurred in Area 6. The sources of the spills includes the above ground tanks, crude transfer pad and pipe alley along the northern perimeter of Area 6. Most releases involved crude oil and the largest spill was the 500 barrel (21,000 gal) crude oil release from tank 1704. The impact of and remedial measures applied to these releases is being studied by the Discharger and will be addressed in the future. This order focuses on compliance of the WMU (ponds) and waste disposal sites in the area.

20. Impoundment Descriptions (COSA - Area 6): The impoundment (ponds) covers about half of Area 6. The discharger indicates that the ponds were constructed on top of a hillside which has been cut and filled to existing topography. The bottom of the ponds are partly underlain by bed rock and partly by fill. The earth perimeter dikes are about 30 feet wide at the top and 60 feet at the base, with dike slope of about 1:1 to 1.5:1 (horizontal :vertical). The impoundment has an average depth of about 4.9 feet, a total capacity of 23,000,000 gallons and a top surface area of 14.3 acres.

21. WMU Sludge (COSA - Area 6): In the report[4] entitled "Report of Waste Discharge" the discharger indicates that no significant amount of sludge existed and did not collect samples. Subsequent reports have stated the same finding. In the past tank bottom sludge and biosludge have been placed within Lake Lund pond. About 4 boring located more than 200 feet apart has been installed to estimate the extent of the bio-sludge spread. Additional sludge and soil investigation will be needed to further define the extent and possible impact.

22. Geology / Hydrogeology (Crude field Retention Ponds - Area 6) - According to the report[4], the Refinery over lies the Mesozoic - age sedimentary and igneous rocks of the Franciscan assemblage, which have been deformed by a series of folding and faulting. This folding and faulting has produced complex geologic structures consisting of shale, sandstone, chert and volcanic rocks. A summary of the local stratigraphy and hydrogeology are as follows:

a. The report[4], indicates that the ponds were directly constructed over engineered fill. The fill ranges from 1 foot in some borings along the south side of the area to 50 feet in some borings at the western side. The fill which consists of fine grain sandy material is underlain by a red brown clayey silt colluvium with interbedded thin sand layers at some locations. The colluvium is underlain by intensely fractured mudstone with interbedded sandstone.

b. The report indicates the presence of one unconfined groundwater body. The water table depths range from 9 feet bgs in piezometer 617, south west of the area, to 41 feet bgs south east of the area. Seasonal fluctuation of the water table ranges from 4 feet to 9 feet. Groundwater flow direction is to the north and east, in the general direction of the slope of the topography. Water level measurement in adjacent wells indicates up to 10 feet elevation difference in a vertical downward gradient. Horizontal groundwater gradients range from 0.002 feet/feet beneath the ponds to 0.1 feet/feet in the northern portion of Area 6. A slug test in well 610, screened in the underlying fill (< 20 feet depth), indicates hydraulic conductivity of $2.0x10^{-04}$ cm/sec. A slug test in other wells screened in the mudstone / sandstone and fractured mud stone zones indicated hydraulic conductivity in the ranges of $2.7x10^{-06}$cm/sec to $1.7x10^{-05}$ cm/sec. Chapter 15 requires that field hydraulic conductivities no more than 10^{-6} cm/sec. must be confirmed in the native soil to assume a natural geologic barrier. The range here falls below this mark and varies, which is typical of native non-homogenous soil. The underlying material is therefore not capable of providing a natural geologic barrier.

23. Groundwater Contamination (Area 6 - COSA Ponds) Groundwater samples from monitoring wells installed in the vicinity of the pond have been analyzed for contaminants and results were documented in two technical reports[4,2] indicated in the reference. Metal and minimal hydrocarbon contamination were detected in the wells. The following summarizes the contaminant concentrations reported:

a. In the report[2], groundwater samples were not analyzed for organic contaminants. CAM metals were not detected at concentrations above their various detection limits except for barium, which was detected at concentrations below 0.009 mg/L. Total dissolved solids range from 1500 mg/L to 1700 mg/L.

b. A 1993 report[4], documented the detection of volatile and semi volatile organic compounds, as well the presence of metals. Total Petroleum Hydrocarbons concentrations as oil and diesel ranged from less than detection limits to 0.98 mg/L for water samples from wells installed at the perimeter and downgradient of the ponds. Benzene, ethyl benzene, toluene, xylene and other organic compounds were not detected in concentrations beyond the analytical reporting limits in those perimeter wells. Monitoring wells installed in other portions of the area 6 (including tank field) detected dissolved organic compounds. The source, however appears to be from the tanks and appending installations rather than from the ponds. In the future attention will be focussed on this problem.

c. This 1993 report[4] documented the results of metal analysis. Metals detected in groundwater samples from perimeter wells include antimony, arsenic, barium, chromium, copper, nickel and selenium. Metals present at concentrations above (California or EPA) MCL includes antimony up to 0.009 mg/L and selenium up to 0.036 mg/L.

24. Soil Contamination (Area 6 - COSA); Pond bottom investigations have been inadequate. For instance, the report[3] indicates the installation of three probes, while the report[6] indicated the installation of six borings in the pond bottom. All six boring were installed in the lake lund. Soil samples from installed borings within and at perimeter of the ponds have been analyzed for contaminants and results were documented in two technical reports[4,2]. The results indicate low hydrocarbon contaminant concentration. Most organic contaminants detected were in the portions of Lake Lund where biosludge was placed. Metals were detected in most samples. The following is a summary of contaminant concentrations in the reports:

a. The 1988 report[2] documented the results of analysis of soil samples from the borings at the perimeter of the ponds. Concentrations of CAM metals detected, range from 60 mg/kg to 70 mg/kg of Barium, 9.5 mg/kg to 13 mg/kg of Arsenic, 36 mg/kg to 230 mg/kg of chromium, 46 mg/kg to 53 mg/kg of nickel, 43 mg/kg to 70 mg/kg of vanadium and 7.6 mg/kg to 40 mg/kg of lead. Analysis for organic contaminants were not included in the investigations.

b. A 1993 report[4], documented the detection of volatile and semi-volatile organic compounds, as well as the presence of metals in the soil. Total Petroleum Hydrocarbon concentrations as gasoline, oil and diesel ranged from less than analytical detection limits to 50 mg/kg for soil samples directly beneath the ponds. volatile organics (benzene, ethyl benzene, Toluene and xylene), were in most cases not detected at concentrations above analytical reporting limits

c. As documented by the 1993 report[4], most of the CAM metals were detected in soil samples beneath ponds. Metals present at designated level concentrations includes arsenic up to 15 mg/kg, barium up to 110 mg/kg, chromium up to 58 mg/kg, copper 63 mg/kg, lead up to 14 mg/kg, nickel up to 67 mg/kg and vanadium up to 64 mg/kg.

25. Remedial Alternative, (Area 6 - COSA Ponds) In the report[2], the discharger concluded that strict compliance with Chapter 15 standards is unreasonably and unnecessarily burdensome. Chapter 15, however allows for engineered alternative for reasons given above. Some of the ponds may qualify for exemptions or could be retrofitted through an engineered alternative. Crude Field ponds may receive treated waste water from the final pond which did not meet its NPDES effluent discharge standards. The limited investigations beneath the ponds indicates low levels of impact on soil and ground water. An exemption may be appropriate, but additional investigation may necessary to further define the extent of contamination. A remedial action may be required after further accumulation of monitoring data.

26. Stability of ponds (COSA Pond - Area 6) - According to the 1993 report[4], seismic areas within 100 km of the ponds includes the San Andreas, hayward, Concord, Green valley, Calaveras, Greenville-Marsh Creek, Vaca-Antioch, Palo Colorado-San Gregorio and Maacama faults. The green valley fault system which is closest to the site (2 km from site), has an approximate maximum credible earthquake (MCE) of 7.0 Richter magnitude and this MCE was used to model the deformation of the site under seismic event. Two stratigraphic profiles were considered. One profile was assumed as 10 feet of fill over bedrock and the other profile was assumed to be 60 feet of fill over 20 feet of alluvium underlain by bedrock at 80 feet. A dynamic computer aided analysis of pond slope deformation predicted 3 feet to 4 feet lateral displacement and about 30 inches of vertical drop in the event of an MCE of 7.0 Richter magnitude. These are significant movements which could result in slope failure and subsequent release of treated groundwater. The discharger should develop an emergency plan to deal with such occurrence.

AREA 10 (BURMA ROAD STOCKPILE)

27. Site History/Description :(Area 10 - Burma Road Stockpile)

a. Area 10 is located in a former naturally sloping terrain with gullies that provided channels for storm water flow to the south of the facility. Beginning in 1968, Exxon filled the area with materials which now constitutes the Burma Road stockpile. The material, according to a 1993 report[5], is estimated to consist of soil excavation from other places, vegetation, construction debris, asphalt rubble and waste from retrofitting activities. The Burma road stockpile occupies about 1 acre, with an elevation of about 240 feet at the northern edge to 170 feet at the southern edge. Stockpile thickness ranges from 0 to 47 feet below ground surface and the estimated volume of the stockpile is 91,380 cubic yards.

b. The investigation to determine soil stratigraphy and hydrogeology beneath the stockpile, constituents of waste, as well as possible contaminant composition in the waste stockpile is not adequate. For instance, only 3 borings at the perimeter and 3 borings within the stockpile were installed. The three perimeter borings was converted into a monitoring wells. The discharger has indicated the option of closing the unit as a landfill. Therefore further investigation may not be necessary. However additional monitoring points will be installed to comply with the provisions of Article 5 of chapter 15.

28. Geology / Hydrogeology (Area 10 - Burma Road stockpile) According to a 1993 report[5], the Refinery over lies the Mesozoic - age sedimentary and igneous rocks of the Franciscan assemblage, which have been deformed by a series of folds and faults. This folding and faulting has produced complex geologic structures consisting of shale, sandstone, chert and volcanic rocks. Local stratigraphy and hydrogeology are as follows:

a. The report[5], indicates that the stockpiles were directly placed on top of native colluvial soil consisting of red brown lean clay varying from 1.5 feet to 5 feet in thickness. The colluvium is under lain by fractured sandstone and mudstone of the Panoche formation.

b. The report[5] indicates the presence of a water table groundwater body. The unconfined groundwater with potentiometric levels of 133 feet to 188 feet msl (33 ft to 52 ft bgs) is susceptible to seasonal fluctuation of up to 8.68 feet. Groundwater flow direction is toward the southeast in the direction of Sulphur Spring and Beaver Creek, and the gradient is about 0.09 feet/feet. Field slug test in the deep screened wells (>30 feet depth) indicates hydraulic conductivity in the range of 2.87×10^{-4} cm/sec to 9.70×10^{-7} cm/sec. Laboratory sample from the colluvium had a vertical hydraulic conductivity of 5.8×10^{-08} cm/sec.

29. Groundwater Contamination (Area 10); Groundwater samples from three installed perimeter monitoring wells have been analyzed for contaminants and results were documented in the 1993 technical report[5]. The following are the summary of contaminant concentrations in the reports:

a. In the report[5], groundwater samples were analyzed for organics contaminants and most contaminants were not detected at or above various reporting limits.

b. The report[5] documented the results of metal analysis from groundwater. Metals detected in groundwater samples from perimeter wells include antimony, arsenic, barium, copper, molybdenum, and selenium. Metals present at concentration above water quality objectives (MCL, California inland surface water, bays and estuaries plan) includes antimony up to 0.011 mg/L and selenium up to 0.014 mg/L.

30. Soil Contamination (Area 10 - Burma Road Stockpile); Soil samples from the perimeter and stockpiles boring has been chemically analyzed for contaminants and results were documented in a an April 15, 1993 technical report[5]. The following is a summary of contaminant concentrations from the report:

a. The results of a previous 1990 investigation were reproduced in the report[5]. Concentration of Total petroleum hydrocarbon (TPH) as diesel, was as high as 2,500 mg/kg and gasoline was less than detection limits. Total oil and grease concentrations ranged from less than detection limits to 5,100 mg/kg. Toluene was detected in the stockpiles at concentrations ranging from 0.02 mg/kg to 2.3 mg/kg. Most analysis for CAM metals detected concentrations above their respective reporting limits except for selenium, cadmium, beryllium, silver, antimony and thallium. Concentration of metals detected were as high as 310 mg/kg for Barium, 91 mg/kg for nickel, 180 mg/kg for chromium, 56 mg/kg for copper, 49 mg/kg for lead, 97 mg/kg for vanadium and 2,600 mg/kg for zinc.

b. Another soil assessment result included in the report[5] (table 9), documented the detection of volatile and semi-volatile organic compounds, as well as the presence of CAM metals in the soil. Total Petroleum Hydrocarbons concentrations as gasoline, oil and diesel ranged from less than detection limits to 250 mg/kg. Volatile organics (benzene, ethyl benzene, toluene and xylene), were not detected at concentrations above their reporting limit. Most analysis for metals detected concentrations above their respective reporting limits except for antimony, selenium, cadmium, silver, molybdenum and thallium. Metals detected at higher concentrations include arsenic as high as 17 mg/kg, Barium as high as 200 mg/kg, chromium as high as 63 mg/kg, copper as high as 74 mg/kg, lead as high as 16 mg/kg, nickel as high 52 mg/kg, vanadium as high as 79 mg/kg and zinc as high as 87 mg/kg.

31. Remedial Alternative (Area 10 - Burma Road Stockpile) In the report[5], the discharger proposes to close the stockpile as landfill pursuant to section 2583 of Chapter 15. Petroleum hydrocarbon and metals has been detected at the stockpile. The discharger indicates that the high hydrocarbon occurrence is related to the presence of asphalt debris which is also a demolition and construction waste. Demolition and construction wastes could be discharged to Class III landfills. The stockpile contains designated waste / construction debris. The stockpile may be appropriately classified as class III landfill and closure pursuant to Section 2581 of Chapter 15 or equivalent engineered alternative is recommended.

AREA 12 (GATE 5 STOCKPILE)

32. Site History/Description (Area 12 - Gate 5 Stockpile) The history, descriptions of site and investigations are as follows:

a. Area 12 is located in a area of moderately steep terrain with a near flat topography at the top. In 1988, Exxon began to fill the area with materials which now constitutes the Gate 5 stockpile. The material, according to the report[5], consists of soil excavation from

other places, scrap lumber, red concrete, steel reinforced concrete, asphalt, sand from blasting and filters, gravel and grass clipping. The Gate 5 stockpile occupies about 1.4 acre, with a surface elevation of about 89 feet to 60. Stockpile thickness range from 0 to 24 feet below ground surface and the estimated volume of this stockpile is about 10, 000 cubic yards.

b. The investigation to determine soil stratigraphy and hydrogeology beneath the stockpile, constituents of waste, as well as possible contaminant composition in the waste stockpile is not adequate. For instance, only four boring were installed to the east of the of the stockpile and just one boring was converted into a monitoring well. The discharger has indicated the option of closing the unit as a landfill. Therefore further investigation may not be necessary. However additional monitoring points will be installed to comply with the provisions of Article 5 of chapter 15.

33. Geology / Hydrogeology (Area 12 - Gate 5 stockpile) The report[5], indicates that the Refinery over lies the Mesozoic - age sedimentary and igneous rocks of Franciscan assemblage, which have been deformed by a series of folding and faulting. This folding and faulting has produced complex geologic structures consisting of shale, sandstone, chert and volcanic rocks. Local stratigraphy and hydrogeology are as follows:

a. The stockpiles consist of sandy gravel and sandy clay and were directly placed on top of native colluvial soil consisting of gray and brown lean clay. The colluvium varies in thickness from 1 foot to 6 feet. The colluvium is under lain by fractured mudstone of the Panoche formation.

b. The report indicates the presence of a water table groundwater body. The unconfined groundwater, with potentiometric levels of 48 feet to 50 feet msl and depths of 14 feet to 16 feet below ground level, is susceptible to seasonal fluctuation of up to 8.68 feet. Groundwater flow direction is toward the east in the direction Sulphur Spring and Beaver Creek. Slug tests in the shallow screened wells (<15 feet depth) indicates a hydraulic conductivity of the fractured mudstone in the range of 1.86×10^{-4} cm/sec.

34. Groundwater Contamination (Areas - Gate 5 stockpile) One monitoring well was completed in this area. Groundwater samples from the monitoring well have been analyzed for contaminants and results were documented in a 1993 technical report[5]. The following is a summary of contaminant concentrations from the report:

a. In the report[5], groundwater samples were analyzed for organic contaminants and most contaminants were not detected at or above various reporting limits.

b. The report[5] documented the results of metal analysis from groundwater. CAM metals detected in groundwater samples from the perimeter well include antimony, arsenic, barium, and copper.

35. Soil Contamination (Area - Gate 5 stockpile) Soil samples from the four perimeter and stockpiles boring have been analyzed for contaminants and results were documented in an April 15, 1993 technical reports[5]. The result indicate that stockpile is contaminated. The summary of contaminant concentrations are documented in the soil assessment report[5]. The report documented the detection of organic compounds, as well as the presence of metals in the soil. Total Petroleum Hydrocarbons concentrations as gasoline, oil and diesel ranged from less than detection limits to 2000 mg/kg. Organics (toluene and xylene), were detected at

concentrations slightly above their reporting limit. Metals detected at concentrations slightly above their respective reporting limits include arsenic, barium, chromium, cobalt, copper, lead, nickel, vanadium and zinc.

36. Remedial Alternative, (Area 12 - Gate 5 stockpile) In the report [5], the discharger proposes to close the stockpile as landfill pursuant to Section 2583 of Chapter 15. Petroleum hydrocarbon and metals has been detected at the stockpile. The discharger indicates that the high hydrocarbon occurrence is related to the presence of asphalt debris which is also a demolition and construction waste. Demolition and construction wastes could be discharged to Class III landfills. The stockpile contains designated waste / construction debris. The stockpile may be appropriately classified as class III landfill and closure pursuant to Section 2581 of Chapter 15 or its equivalent is recommended.

GENERAL FINDINGS

37. Chemicals of Concern. Soil and ground water contaminants and parameters consist of total petroleum hydrocarbons as gasoline, diesel, kerosene, and total oil and grease, benzene, toluene, ethylbenzene, xylene and other volatile and semi volatile organic compounds. Most metals except silver, molybdenum and thallium were detected in soil or groundwater beneath and surrounding the impoundment/stockpile. Bioassay tests indicated, a possible toxicity of groundwater to aquatic life.

38. Water Quality Goals. Article 5 of Chapter 15 specifies the water quality monitoring and response programs for waste management units. Pursuant to Article 5 of Chapter 15 background water quality shall be established as goals for the waste management units regulated by this Order.

    a. The background water quality is considered non detectable for total petroleum hydrocarbons, total oil and grease, and benzene, toluene, ethylbenzene, and xylene, other volatile organic and semi volatile organic compounds according to test methods specified in the attached Self Monitoring Program.

    b. Elevated concentrations of inorganic constituents and parameters has been detected upgradient, downgradient, co - gradient and within the waste management units. In addition the naturally occurring concentrations has not been defined. Further study will be needed to determine the appropriate water quality protection standards for inorganic for the units and the Refinery in general.

39. Reference to Regulations. References to Chapter 15 are to Division 3, Title 23 of the California Code of Regulations.

40. Cost Reimbursement. The Board finds that the reasonable costs of the State Water Resources Control Board and the Regional Water Quality Control Board in the oversight of the cleanup and retrofitting activities required by this Order are to be reimbursed to the State by the discharger in accordance with Section 13304 of the Water Code.

41. Beneficial Uses.

    a. Surface Waters. The existing and potential beneficial uses of the Suisun Bay, Carquinez Strait, Beaver Creek and Sulphur Spring Creek are:

(1) Industrial Process and Service Supply;
(2) Navigation;
(3) Water Contact Recreation;
(4) Non-Contact Recreation;
(5) Ocean Commercial and Sport Fishing;
(6) Wildlife Habitat;
(7) Preservation of Rare and Endangered Species;
(8) Fish Migration and Spawning;
(9) Shellfish Harvesting, and;
(10) Estuarine Habitat.

b. Ground Waters. The Discharger indicates that groundwater at the site is not utilized for drinking water purposes. However groundwater uses within one mile of the facility was not defined in the reports. The potential beneficial uses of groundwater in the vicinity of the waste management units are:

i. Industrial and domestic water supply for both deep and shallow aquifers in the Gate 5 stockpile, Burma Road stockpile and Crude Field retention ponds areas and;

ii. Industrial service and agricultural supply for shallow ground water in the waste water treatment ponds area. Shallow groundwater in area 1 is currently impaired may not qualify as potential domestic water supply at present.

iii. Domestic, industrial and agricultural for deeper lying aquifers beneath all the waste management units.

42. Basin Plan. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) on December 17, 1986 and amended it August 19, 1987, July 18, 1989, December 11, 1991 and September 1992. In addition the State Water Board adopted state wide plans for enclosed bays, estuaries and inland surface water bodies in April 11, 1991. These Basin Plans contain water quality objectives and beneficial uses for San Francisco Bay and contiguous surface and ground water including the water bodies identified in "Finding 39" of this order. This Order implements the water quality objectives for the north San Francisco Bay as stated in the Basin Plan.

43. California Environmental Quality Act. This action is exempt from the provisions of the California Environmental Quality Act pursuant to Section 15308, Title 14 of the California Code of Regulations "Action by Regulatory Agencies to Protect the Environment"

44. Notification. The Board has notified the discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with the opportunity to submit their written views and recommendations.

45. Hearing. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, that the discharger or its agents, successors or assigns, in order to meet the provisions of Division 7 of the California Water Code, shall comply with the following:

A. PROHIBITIONS

1. The discharge of wastes or hazardous materials in a manner which will degrade water quality or adversely affect the beneficial uses of the waters of the State of California is prohibited.

2. Further significant migration of pollutants through subsurface transport to waters of the State of California is prohibited. Significant migration shall be deemed to occur if:

   a. Constituent concentrations exceed or equals established water quality protection standards at points of compliance.

   b. Incidents, activities directly or indirectly caused by Exxon, which is deemed or suspected to cause further migration of contaminants at existing discharge areas or currently applied discharge.

3. Activities, associated with the subsurface investigation and site cleanup, that cause significant adverse migration of pollutants are prohibited, except as approved by the Executive Officer of the Board.

4. Wastes shall not be disposed of in any way, where they can be carried from the disposal site and discharged into waters of the State or of the United States.

5. The treatment, discharge, or storage of wastes or materials which may impact the beneficial uses of ground and surface water shall not be allowed to create a condition of pollution or nuisance as defined in sections 13350 of the California Water Code.

B. SPECIFICATIONS

1. General Specification _ The Discharger shall abide by the following specifications:

   a. The storage, handling, treatment or disposal (if ground water quality standards are exceeded) of soil or ground water containing pollutants shall not create a nuisance as defined in Section 13050(m) of the California Water Code.

   b. The discharger shall carry out remedial actions for the waste management units at the site in a manner acceptable to the Executive Officer.

   c. If ground water extraction and treatment is considered as part of remedial activity, the feasibility of water reuse, reinjection, and disposal to the sanitary sewer must be evaluated. Based on the Regional Board Resolution 88-160, the discharger shall optimize, with a goal of 100%, the reclamation or reuse of ground water extracted. The discharger shall not be found in violation of this Order if documented factors beyond the discharger's control prevent the discharger from attaining this goal, provided the discharger has made a good faith effort to attain this goal. If reuse or reinjection is part of a proposed alternative, an application for Site Cleanup Requirements may be required. If discharge to waters of the State is part of a proposed alternative, an application for an NPDES permit must be completed and submitted, and must include the evaluation of the feasibility of water reuse, reinjection, and disposal if ground water quality standards are exceeded to the sanitary sewer.

d. The discharger shall operate the waste management units so as not to cause a significant difference to exist between water quality at the compliance points and Water Quality Protection Standards to be established for the following applicable parameters. The discharger shall establish water quality protection standards as approved by the Board, according to the requirements of this Order and Article 5 of Chapter 15 for the following minimum parameters:

pH;
Electrical conductivity;
Total dissolved solids;
Chloride;
Total petroleum hydrocarbons as gasoline;
Total petroleum hydrocarbons as diesel;
Total petroleum hydrocarbons as kerosene;
Total oil and grease;
Metal Contaminants, and;
Volatile and semi volatile Organics

e. The concentrations of indicator parameters or waste constituents in waters passing through points of compliance, (as defined in the Self Monitoring Program for each waste management unit attached herein), shall not exceed the Water Quality Protection Standards, established by the provisions of this Order.

f. The waste management units shall not cause migration of wastes to adjacent geologic materials, groundwater, or surface water, throughout the operation, closure, and post closure periods pursuant to the provisions of Chapter 15.

2. Specifications for Operating Waste Management Units (WMU) - The Discharger shall operate the units to meet the following specifications:

a. The waste water treatment ponds (Retention and Equalization) shall not be classified in this Order. Following submission of the technical reports as required in the provisions of the this Order, the Board's staff shall determine if classification is appropriate. Remedial actions shall meet the intents of chapter 15 as approved by the Executive Officer. The discharger shall implement the monitoring requirements of the provisions of Article 5 of Chapter 15 and shall institute a regular sludge monitoring and removal program.

b. The classification status of the Waste Water treatment pond (Final) shall be determined by Board's staff following the submittal of additional pond bottom and subsurface investigations required in the provisions of this order. The Board may consider conditional exemption of the pond following the review of results of investigation.

c. The Crude Field Pond (Lake Lund, Lee, Spalding) shall be exempt from classification pursuant to Section 2511 of Chapter 15. The discharger shall implement the monitoring requirements of the provisions of Article 5 of chapter 15 and shall institute a regular pond bottom monitoring program. The discharger shall retrofit the pond to a Class II WMU, if monitoring results continue to indicate evidence of contamination from the pond content.

d. The Burma road stockpile shall be excavated and disposed in an appropriate facility or closed in place as a Class III Landfill pursuant to the closure requirements of Chapter 15.

e. The Gate 5 stockpile shall be excavated and disposed in an appropriate facility or closed in place as class III Landfill pursuant to the closure requirements of Chapter 15.

C. PROVISIONS

1. The discharger shall, in a timely manner, submit work descriptions and draft technical reports to Board staff for all technical reports required in these Provisions. The discharger may be assessed monetary penalties for late or incomplete technical reports required by these Provisions.

2. The discharger shall reimburse the State Water Resources Control Board and the Regional Water Quality Control Board for their reasonable costs in the oversight of cleanup activities.

3. The discharger shall comply with the Prohibitions and Specifications above, in accordance with the following time schedule and tasks:

a. Stockpiles. All stockpiles (Burma road and Gate 5) shall be excavated and disposed of or shall be closed in place as Class III waste management units constructed in accordance with Chapter 15 standards or acceptable alternative standards. The discharger shall document all phases of work and shall submit technical construction reports as follows:

(1) The discharger shall submit a stockpile remediation plan (closure and post closure maintenance plan) for compliance with Chapter 15 standards or alternatives, acceptable to the Executive Officer. The plan shall address all applicable requirements of Chapter 15 including Articles 5, of Chapter 15.

Report Due: No later than January 16, 1995.

(2) The discharger shall submit a certification of construction and closure reports according to the remediation plan, as acceptable to the Executive Officer.

Report Due: No later than January 17, 1996.

b. Crude Field Retention Ponds & Waste Water Treatment Plant's Final Pond. The discharger shall submit the following technical reports:

(1) A Workplan, acceptable to the Executive Officer for subsurface investigation (pond bottom) at the final pond. In lieu of this plan Exxon may commit to either a closure plan for this pond or propose a plan for investigation which will lead to a preferred remedial alternative as approved by the Board.

Report Due: No later than Jan 16, 1995.

(2) A workplan for sediment and groundwater monitoring for the final and crude field ponds as acceptable to the Executive Officer.

Report Due: No later than January 16 1995.

(3) The discharger shall submit a report of the investigations containing at least one round of groundwater monitoring results in accord with Provision 3.b.(1). and as acceptable to the Executive Officer.

Report Due: No Later Than January 17, 1996

c. Waste Water Treatment Pond (Retention & Equalization Pond). All ponds shall be closed in place or retrofitted as applicable in accordance with Chapter 15 descriptive standards or acceptable alternatives. The discharger shall document all phases of work and shall submit construction technical reports as follows:

(1) The discharger shall submit a pond remediation plan for compliance with Chapter 15 standards or alternatives, as acceptable to the Executive Officer. The plan shall address all applicable requirements of chapter 15 including Article 5, of chapter 15.

Report Due: No later than July 3, 1995.

(2) The discharger shall submit a report of certification of construction and / or closure according to the remediation plan, acceptable to the Executive Officer.

Report Due: No later than November 4, 1997.

d. Tank 1704 Embankments - The report[4] indicated that treated soil from the crude oil spill excavation was used for berm construction in Area 6. Treatment process documentation, soil placement and cover construction reports were not submitted for review and approval. The discharger shall submit these report if available or conduct a site assessment to determine the residual level of contaminated soil placed in the berms. The Discharger shall submit the workplan and report of investigation as acceptable to the Executive Officer.

Workplan Due: No Later Than Jan 16, 1995.
Report Due: No Later Than December November 16, 1995.

e. Post Earthquake Inspection and Corrective Action Plan. The discharger shall submit a detailed Post Earthquake Inspection and Corrective Action Plan for all waste management units, to be implemented in the event of any earthquake generating ground shaking of Modified Mercalli Intensity V or greater at or near the waste management unit. The report shall describe the containment features, and ground water monitoring and leachate control facilities potentially impacted by the static and seismic deformations of the waste management unit. The plan shall provide for preliminary reporting of the post earthquake inspection to the Board within 18 hours of the occurrence of the earthquake.

Immediately after an earthquake event causing damage to the waste management unit structures, the corrective action plan shall be implemented and this Board shall be notified of any damage.

Report Due: No later than the workplan due dates for each WMU as indicated in Provisions 3.a., 3.b. and 3.c.

f. Leachate Management Plan. The discharger shall prepare and submit a detailed Leachate Management Plan for the waste management unit. This plan shall estimate the quantity of leachate produced, properties and design leachate storage facility, and (if ground water quality standards are exceeded) the ultimate disposal method. The report shall evaluate the quantity of leachate produced from the waste management unit and determine the maximum safe operating level for the leachate containment facilities. In addition, the plan shall provide for an emergency leachate containment capacity of 150% of the primary containment facility. The plan shall provide a detailed assessment of alternative treatment and disposal methods if ground water quality standards are exceeded, along with a plan for implementation of a preferred alternative or combination of alternatives.

Report Due: The Executive Officer may request preparation and submittal of this report at any time when deemed necessary.

g. Precipitation and Drainage Control. Pursuant to Chapter 15 requirements waste management units and containment structures shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout and overtopping under precipitation conditions. Technical plan reports prepared for closure and / or retrofitting of waste management units shall include a precipitation and drainage control plan and design for implementation.

h. Irrevocable Closure Fund. For the classified waste management units the discharger shall provide and submit to this Board, evidence of an Irrevocable Closure Fund, pursuant to Section 2580(f) of Chapter 15. The Closure Fund must provide sufficient funds to properly close the waste management unit and for the post-closure monitoring and maintenance of the site. For the purposes of planning the amount of the fund, the discharger shall assume a post-closure period of at least 30 years. However, the post-closure maintenance period shall extend as long as the waste pose a threat to water quality.

Report Due: No later than the workplan plan due dates for the WMU as indicated in Provisions 3.a., 3.b. and 3.c.

i. Closure and Post-Closure Maintenance Plan. The discharger shall submit to the Board, for approval, a closure and post-closure maintenance plan for the waste management units pursuant to Title 23, CCR, Chapter 15, Article 9, Section 2597.

Report Due: No later than the remediation plan due dates for the WMU indicated in Provisions 3.a., 3.b. and 3.c.

j. Ground Water Quality Protection Standards. The discharger shall submit in accordance with the requirements of Article 5 of Chapter 15 a report on the groundwater quality at the site that proposes WMU water quality protection standards for the constituents listed in the Specifications of this Order.

Report Due: No later than the remediation plan due dates for the WMU indicated in Provisions 3.a., 3.b. and 3.c.

4. The discharger shall maintain a copy of this order at the project field office so as to be available at all times to project personnel.

5. The discharger's technical reports under subparagraph 3.a, 3.b, 3.c and 3.d hereof shall consider the guidance provided by the State Water Resources Control Board's Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California".

6. Technical reports, submitted by the discharger, in compliance with the Prohibitions, Specifications, and Provisions of this Order shall be submitted to the Board on the schedule specified herein. These reports shall consist of a letter report that includes the following:

   a. A summary of work completed since submittal of the previous report and work projected to be completed by the time of the next report;

   b. Identification of any obstacles which may threaten compliance with the schedule of this Order and what actions are being taken to overcome these obstacles;

   c. In the event of non-compliance with any Prohibition, Specification or Provision of this Order, written notification which clarifies the reasons for non-compliance and which proposes specific measures and a schedule to achieve compliance. This written notification shall identify work not completed that was projected for completion, and shall identify the impact of non-compliance on achieving compliance with the remaining requirements of this Order, and;

   d. In the first self-monitoring report, an evaluation of the current ground water monitoring system and a proposal for modifications as appropriate.

7. All submittal of hydrogeological plans, specifications, reports, and documents (except quarterly progress and self-monitoring reports), shall be signed by and stamped with the seal of a registered geologist, registered engineering geologist, or registered professional civil engineer.

8. All samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control records for Board review.

9. The discharger shall maintain in good working order, and operate as efficiently as possible, any facility or control system installed to achieve compliance with the requirements of this Order.

10. Copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order, submitted by the discharger, shall also be provided to the following agencies:

    a. City of Benicia, Planning Department;
    b. Solano County Health Department, and;
    c. California EPA, DTSC.

11. The discharger shall permit the Board or its authorized representative, in accordance with Section 13267(c) of the California Water Code, the following:

    a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any required records are kept, which are relevant to this Order;

    b. Access to copy all records required to be kept under the terms and conditions of this Order;

    c. Inspection of any monitoring equipment or methodology implemented in response to this Order; and,

    d. Sampling of any ground water or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.

12. The discharger shall file with this Board a report of any material change or proposed change in the character, location, or quantity of this waste discharge. For the purpose of these requirements, this includes any proposed change in the boundaries, contours, or ownership of the disposal if ground water quality standards are exceeded areas.

13. The Board considers the discharger, Exxon Company, the property owner and site operator to have a continuing responsibility for correcting any problems within their reasonable control which arise in the future as a result of this waste discharge or water applied to this property during subsequent use of the land for other purposes.

14. These requirements do not authorize the commission of any act causing injury to the property of another or of the public, do not convey any property rights, do not remove liability under federal, state or local laws, and do not authorize the discharge of waste without the appropriate federal, state or local permits, authorizations, or determinations.

15. If hazardous substances or designated waste is discharged in or on any waters of the state, or discharged and deposited in any place where it may be carried off to, or probably will be discharged in or on any waters of the state, the discharger shall report such discharge / incidents to the following:

    a. This Regional Board at (510) 286-1255 on weekdays during office hours from 8 a.m. to 5 p.m.; and,

    b. The Office of Emergency Services at (800) 852- 7550.

    Hazardous and designated substances include wastes and chemicals as defined in Title

22 and Title 23 of the California code of Regulation and the California Water Quality control Act. A written report shall be filed with the Regional Board within five working days and shall contain information relative to the following:

c. The nature of waste or pollutant;
d. The quantity involved and the duration of incident;
e. The cause of spill;
f. The estimated size of affected area;
g. The corrective measures that have been taken or planned, and a schedule of these measures; and,
h. The persons/agencies notified.

16. The Board will review this Order periodically and may revise the requirements when necessary.

17. This Order amends Order No. 91 - 094. Order No. 91 - 094 remains in effect.

18. If, for reasons beyond the control of the discharger, the discharger is delayed, interrupted or prevented from meeting one or more of the completion dates specified in this Order, the discharger shall promptly notify the Executive Officer and the Board may consider revision to this Order.

19. This Order is subject to Board review and updating, as necessary, to comply with changing state or Federal Laws, regulations, policies, or guidelines; changes in the Board's Basin plan; or changes in the discharge characteristics.

I, Steven R. Ritchie, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region on June 15, 1994.

Steven R. Ritchie
Executive Officer

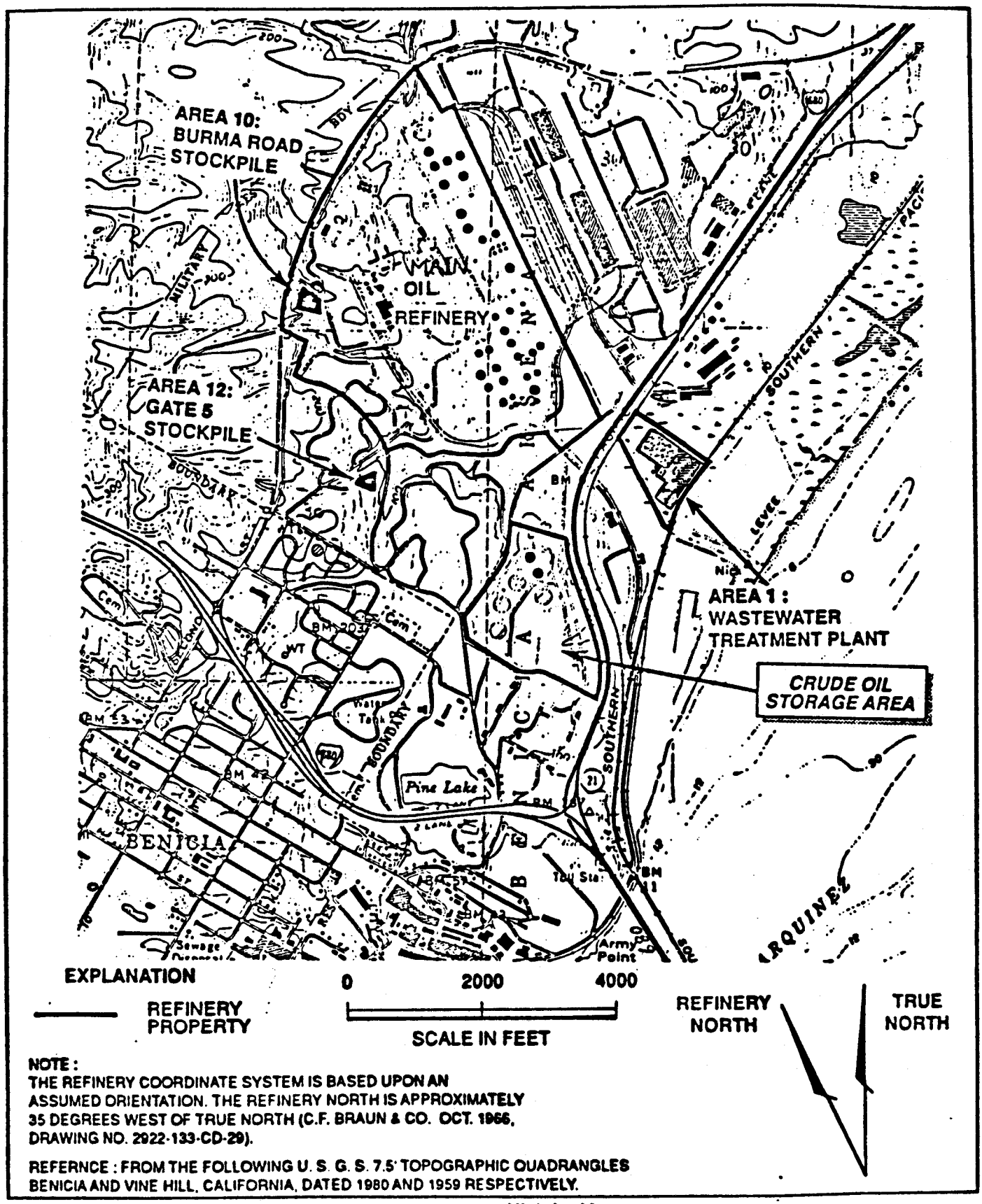
Attachments:
Table 1: Waste Water Treatment Pond Dimensions
Figure 2: Site Map
Figure 3: Area 1 (Waste Water Treatment Ponds (WWTP))
Figure 3B: Area 1 (Reconstructed Waste Water Treatment Ponds)
Figure 4: Area 6 (Crude Field Retention Ponds)
Figure 5: Area 10 (Burma Road Stockpile)
Figure 6: Area 12 (Gate 5 Stockpile)
Self Monitoring Program
References

	BEFORE 1993 RECONSTRUCTION			AFTER 1993 RECONSTRUCTION		
	Surface Area (sq ft) (acres)	Avg Depth (feet)	Capacity (gallons) (barrels)	Surface Area (sq ft) (acres)	Efectv Depth (feet)	Effective Capacity (gallons) (barrels)
Equlztn Pond	56,628 sq ft 1.3 acres		1,500,000 g 35,714 b	43,200 sq ft 0.99 acres	4.69	1,530,00 g 36,429 b
Retention Pond	152,460 sq ft 3.5 acres		5,000,000 g 119,048 b	329,400 sq ft 7.56 acres	4.49 - 4.69	11,350,000 g 270,238 b
Final Pond	261,360 sq ft 6 acres		8,400,000 g 200,000 b	74,000 sq ft 1.7 acres	4.49	2,490,000 g 59,174 b
All Ponds		2.4 - 4.3			4.49 - 4.69	

Based on the 1993 survey, the WWTP pond dimensions are:

	Area	Effective Depth
Equalization Pond	120 ft x 360 ft	4.69 feet
Original (old section of) Retention Pond	440 ft x 360 ft	4.69 feet
New Section of Retention Pond (formerly part of the Final Pond)	380 ft x 450 ft	4.49 feet
Final Pond	200 ft x 370 ft	4.49 feet

Table 1 WWTP POND DIMENSIONS



NOTE :
THE REFINERY COORDINATE SYSTEM IS BASED UPON AN ASSUMED ORIENTATION. THE REFINERY NORTH IS APPROXIMATELY 35 DEGREES WEST OF TRUE NORTH (C.F. BRAUN & CO. OCT. 1966, DRAWING NO. 2922-133-CD-29).

REFERNCE : FROM THE FOLLOWING U. S. G. S. 7.5' TOPOGRAPHIC QUADRANGLES BENICIA AND VINE HILL, CALIFORNIA, DATED 1980 AND 1959 RESPECTIVELY.

Vicinity Map
Assessment Report

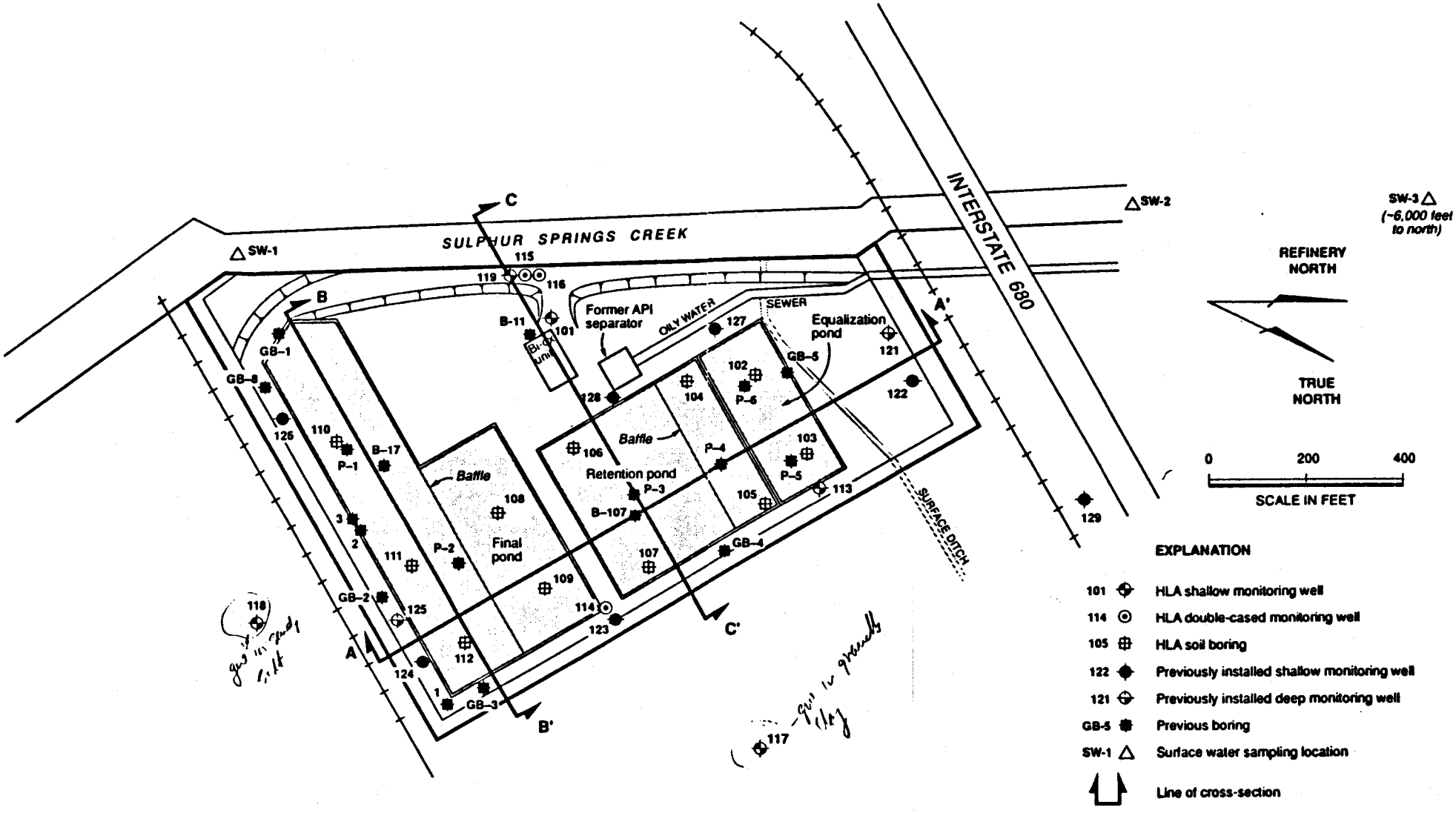
Figure 2

Exxon Refinery
Benicia, California

APPROVED

DATE
09/21/92

REVISED DATE



NOTE :
THE REFINERY COORDINATE SYSTEM IS BASED UPON AN ASSUMED ORIENTATION. THE REFINERY NORTH IS ACTUALLY IN A NORTHWESTERLY DIRECTION.

REFERENCE : C.F. BRAUN & CO. OCT. 1966, DRAWING NO. 2922-133-CD-1 THROUGH 29.

Figure 3

Map of Area 1
Assessment Report
Wastewater Treatment Plant
Exxon Refinery
Benicia, California

APPROVED

DATE 9/30/92

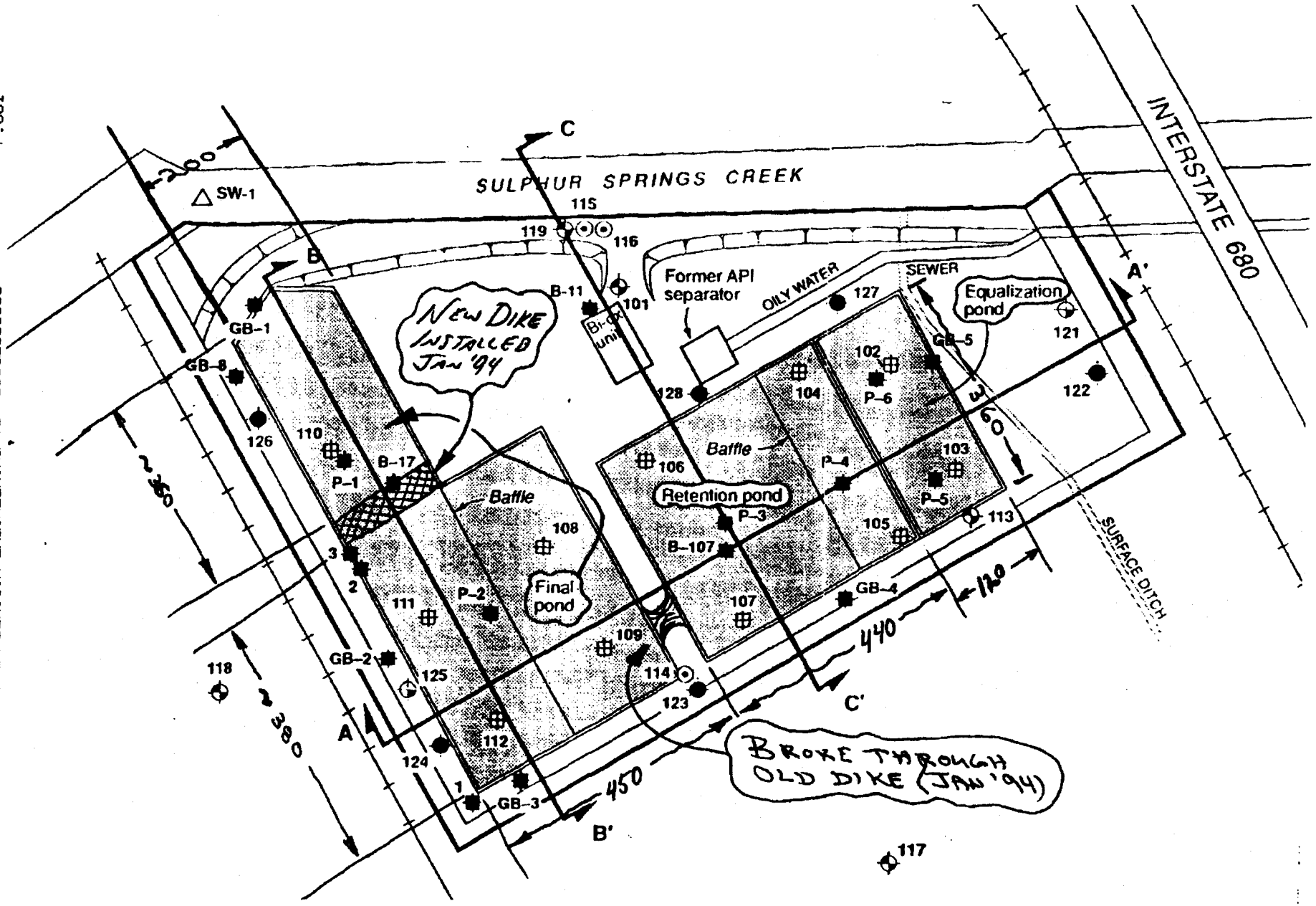
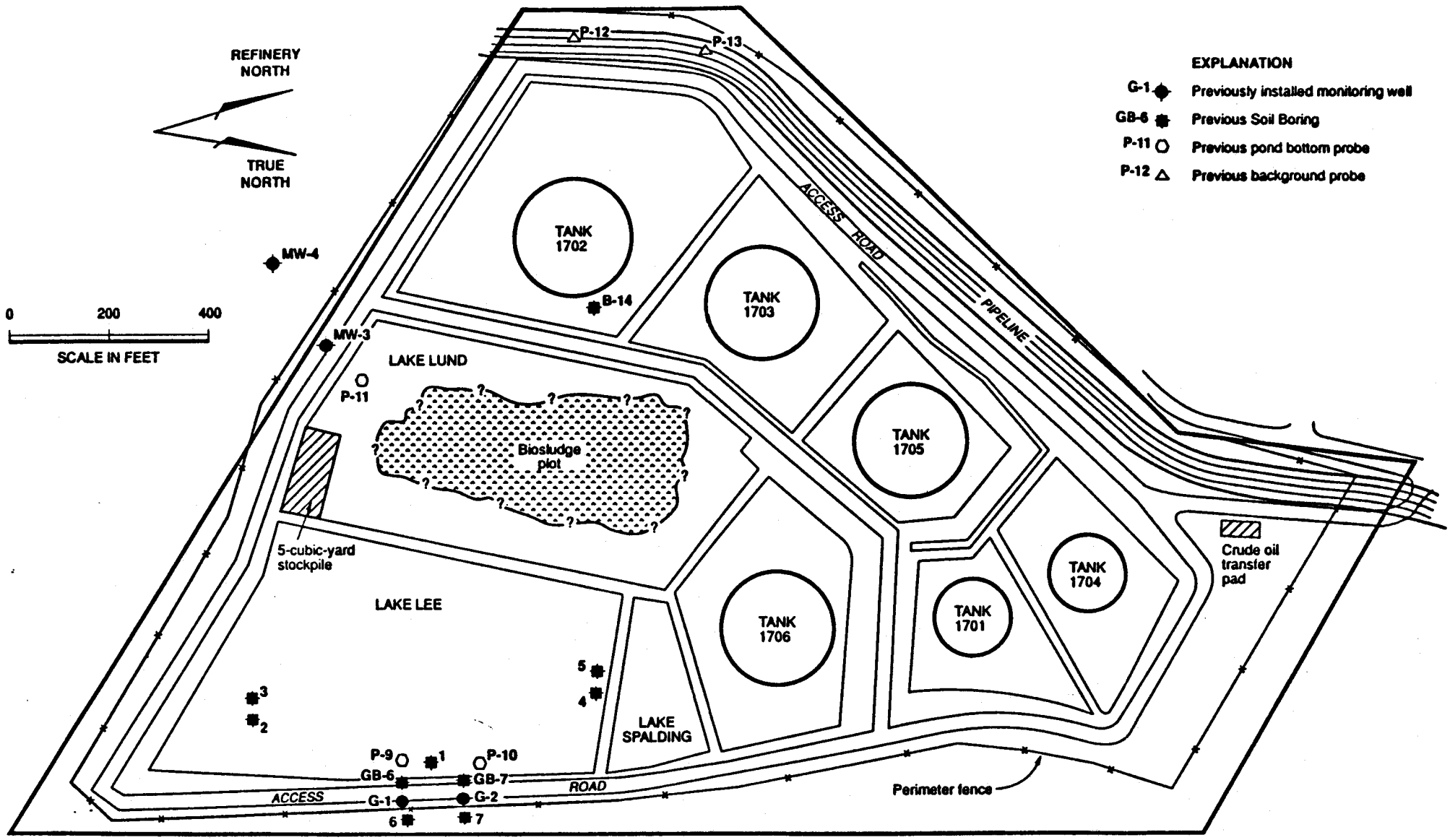


Figure 3B (Reconstructed Waste Water Treatment Ponds)



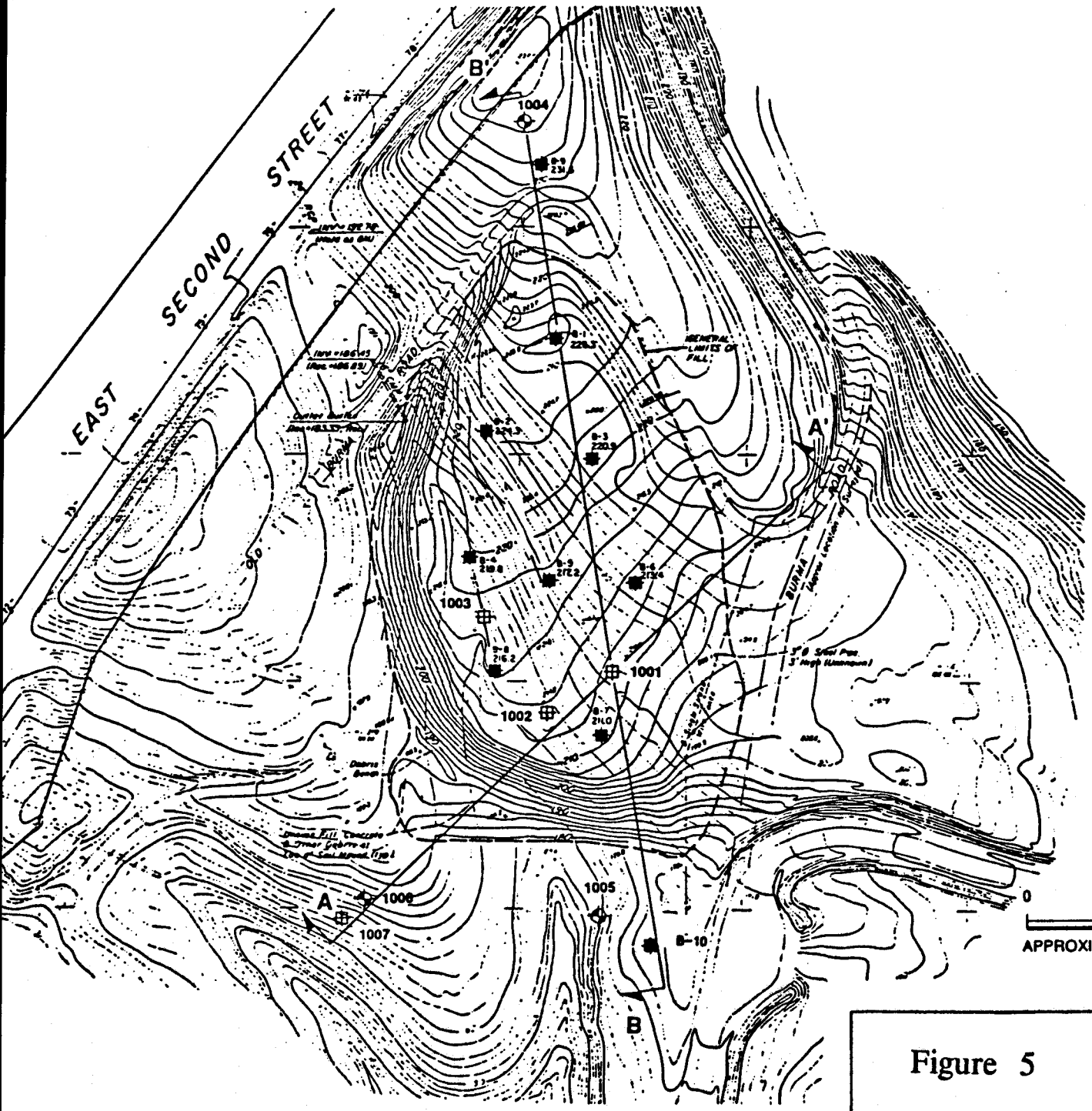
NOTE :
THE REFINERY COORDINATE SYSTEM IS BASED UPON AN ASSUMED ORIENTATION. THE REFINERY NORTH IS APPROXIMATELY 35 DEGREES WEST OF TRUE NORTH.

REFERENCE : C.F. BRAUN & CO. OCT. 1966, DRAWING NO. 2922-133-CD-108 THROUGH 126.

Figure 4

Map of Area 6 - Previous Studies
Assessment Report
Crude Oil Storage Area
Exxon Refinery, Benicia, California

APPROVED	DATE	REVISE
	4/28/93	



EXPLANATION

1004 ⊕	HLA shallow monitoring well
1003 ⊞	HLA soil boring
B-1 ✱	Previous boring
	Lines of cross-section
BM	Benchmark

NOTE :
THE REFINERY COORDINATE SYSTEM IS BASED UPON AN ASSUMED ORIENTATION. THE REFINERY NORTH IS APPROXIMATELY 35 DEGREES WEST OF TRUE NORTH (C.F. BRAUN & CO. OCTOBER 1966, DRAWING NO. 2922-133-CD-29).

HORIZONTAL AND VERTICAL CONTROL WAS TAKEN FROM ELEVATIONS AND COORDINATES SHOWN ON A PHOTOGRAMMETRIC MAP COMPILED BY HAMMON, JENSEN & WALLEN USING AERIAL PHOTOGRAPHY DATED SEPTEMBER 23, 1966.

ALL HORIZONATAL AND VERTICAL CONTROLS WERE ESTABLISHED BY RIFFE, SHIPHERD AND JONES, INC., BASED UPON BENICIA EXXON PLANT GRID SYSTEM AND U.S.G.S. DATUM.

EARTH QUANTITIES ARE BASED ON THE DIFFERENCE BETWEEN THE AERIAL PHOTOGRAPHY DATED 1966 AND A SURVEY PERFORMED BY CULLEN ENGINEERING ASSOCIATES, INC. ON FEBRUARY 8, 1990. ESTIMATED QUANTITY OF FILL: 91,380 CUBIC YARDS.

REFERENCE : CULLEN ENGINEERING ASSOCIATES INC. TOPOGRAPHIC SURVEY SOIL MOUND AT EXXON BENICIA REFINERY.

REFINERY NORTH

TRUE NORTH

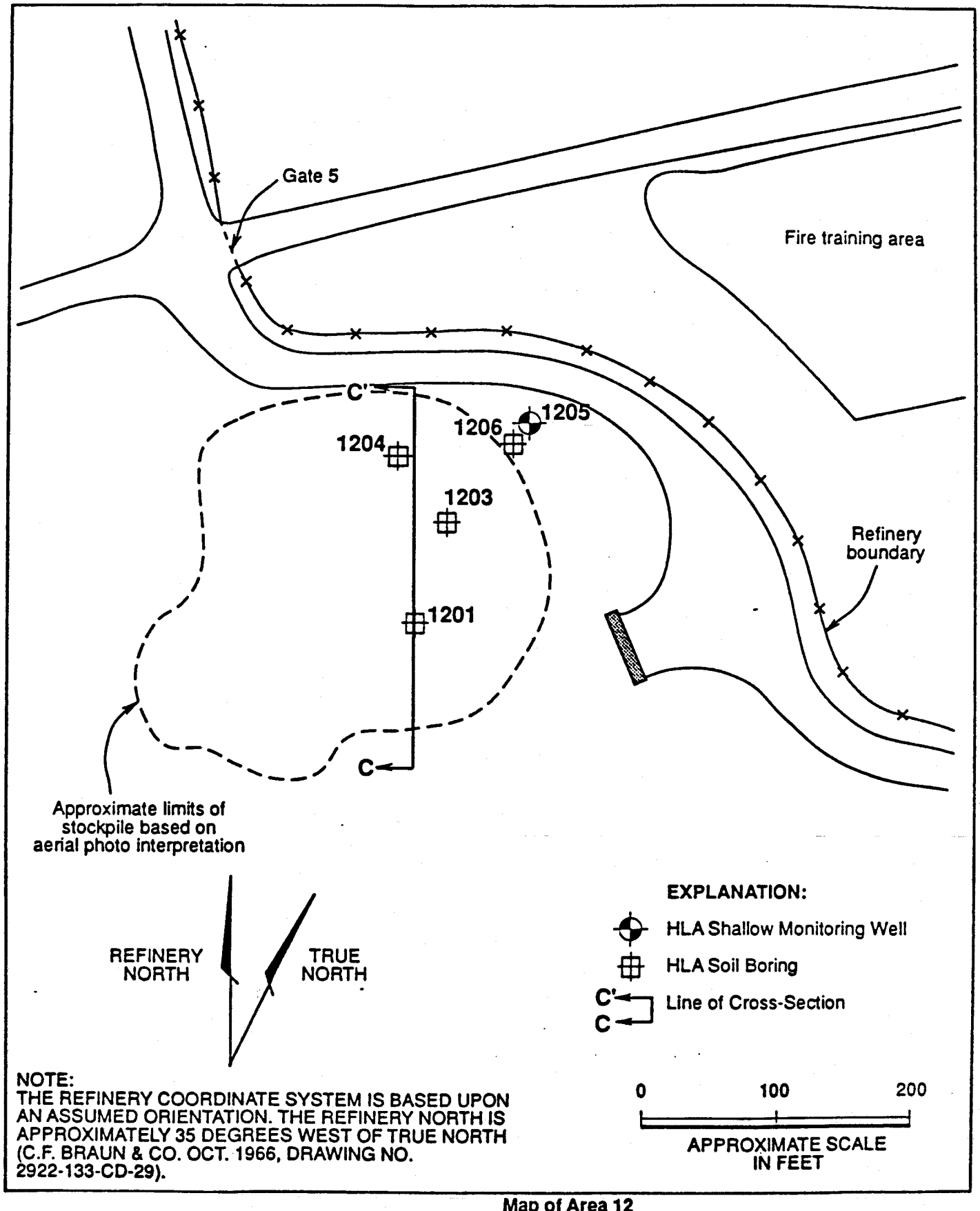
Figure 5

Map of Area 10
Assessment Report
Burma Road Stockpile
Exxon Refinery
Benicia, California

APPROVED

DATE 1/5/93

REV



Map of Area 12
Assessment Report
Gate 5 Stockpile
Exxon Refinery
Benica, California

Figure 6

APPROVED	DATE	REVISED DATE
	2/16/93	

REFERENCES

1. ASSESSMENT REPORT - AREA 1: WASTEWATER TREATMENT PLANT, SEPTEMBER 30, 1992.

2. REPORT OF WASTE DISCHARGE: WASTEWATER TREATMENT PONDS AND CRUDE FIELD RETENTION POND, JUNE 8, 1988.

3. DRAFT REPORT: WASTEWATER TREATMENT POND CHARACTERIZATION, AUGUST 22, 1989.

4 ASSESSMENT REPORT - AREA 6: CRUDE OIL STORAGE AREA, APRIL 29, 1993.

5 ASSESSMENT REPORT - AREA 10: BURMA ROAD STOCKPILE;
AREA 12: GATE 5 STOCKPILE, APRIL 15, 93.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

EXXON COMPANY U.S.A.

3400 East Second ST.,

BENICIA, SOLANO COUNTY

WASTE DISCHARGE REQUIREMENTS
ORDER NO. 94 - 070

CONSISTS OF

PART A

AND

PART B

PART A

A. General

1. Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13383, and 13387(b) of the California Water Code and this Regional Board's Resolution No. 73-16.

2. The principal purposes of a self-monitoring program by a waste discharger are the following:
   a. To document compliance with Waste Discharge Requirements and prohibitions established by the Board;

   b. To facilitate self-policing by the waste discharger in the prevention and abatement of pollution arising from waste discharge;

   c. To develop or assist in the development of standards of performance, toxicity standards and other standards; and,

   d. To prepare water and wastewater quality inventories.

B. Sampling And Analytical Methods

1. Sample collection, storage, and analyses shall be performed according to the most recent version of Standard Methods for the Analysis of Wastewater, and Test Methods for Evaluating Solid Waste EPA Document SW-846, or other EPA approved methods and in accordance with an approved sampling and analysis plan.

2. Water and waste analysis (except total suspended solids) shall be performed by a laboratory approved for these analyses by the State Department of Health. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Regional Board.

3. All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements.

C. Definition Of Terms

1. A grab sample is a discrete sample collected at any time.

2. Duly authorized representative is a duly authorized representative may thus be either a named individual or any individual occupying a named position such as the following:

   a. Authorization is made in writing by a principal executive officer; or,

   b. Authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as general partner in a partnership, sole proprietor in a sole proprietorship, the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall

responsibility for environmental matters for the company.

D. Schedule Of Sampling, Analysis, And Observations

1. The discharger is required to perform sampling, analysis, and observations according to the schedule specified in Part B, and the requirements in Article 5 of Subchapter 15.

2. A statistical analysis shall be performed and reported annually as described in the current revision of Appendix II of Subchapter 15.

E. Records To Be Maintained By The Discharger

1. Written reports shall be maintained by the discharger for ground water monitoring and wastewater sampling, and shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Board. Such records shall show the following for each sample:

   a. Identity of sample and sample station number;
   b. Date and time of sampling;
   c. Method of composite sampling (See Section C-Definition of Terms);
   d. Date and time that analyses are started and completed, and name of the personnel performing the analyses;
   e. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used. A reference to a specific section of a reference required in Part A Section B is satisfactory;
   f. Calculation of results;
   g. Results of analyses, and detection limits for each analyses; and,
   h. Chain of custody forms for each sample.

F. Reports To Be Filed With The Board

1. Ground water monitoring results shall be filed monthly until the schedule allows quarterly samples, then reports shall be quarterly. Written self-monitoring reports shall be filed no later than 45 calendar days following the end of the report period. In addition an annual report shall be filed as indicated. The reports shall be comprised of the following:

   a. Letter of Transmittal - A letter transmitting the essential points in each self-monitoring report should accompany each report. Such a letter shall include a discussion of any requirement violations found during the last report period, and actions taken or planned for correcting the violations, such as, operation and/or facilities modifications. If the discharger has previously submitted a detailed time schedule for correcting requirement violations, a reference to the correspondence transmitting such schedule will be satisfactory. If no violations have occurred in the last report period this shall be stated in the letter of transmittal. Monitoring reports and the letter transmitting the monitoring reports shall be signed by a principal executive officer at the level of vice president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates. The letter shall contain a statement by the official, under penalty of

perjury, that to the best of the signer's knowledge the report is true, complete, and correct. The letter shall contain the following certification:

"I certify under penalty of law that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

b. Each monitoring report shall include a compliance evaluation summary sheet. Until the Order's amended to specify ground water protection standards, the following shall apply and the compliance sheet shall contain:

i. The method and time of water level measurement, the type of pump used for purging, pump placement in the well, method of purging, pumping rate, equipment and methods used to monitor field Ph, temperature, and conductivity during purging, calibration of the field equipment, results of the Ph, temperature conductivity and turbidity testing, well recovery time, and method of disposing of the purge water; and,

ii. Type of pump used, pump placement for sampling, a detailed description of the sampling procedure; number and description of equipment, field and travel blanks; number and description of duplicate samples; type of sample containers and preservatives used, the date and time of sampling, the name and qualifications of the person actually taking the samples, and any other observations; the chain of custody record.

c. A summary of the status of any remediation work performed during the reporting period. This shall be a brief and concise summary of the work initiated and completed as follows:

i. As interim corrective action measures; and,

ii. To define the extent and rate of migrations of waste constituents in the soil and ground water at the site.

d. The discharger shall describe, in the quarterly report, the reasons for significant increases in a pollutant concentration at a well on site. The description shall include the following:

i. The source of the increase;

ii. How the discharger determined or will investigate the source of the increase; and,

iii. What source removal measures have been completed or will be proposed.

e. A map or aerial photograph showing observation and monitoring station locations, and plume contours for each chemical in each aquifer shall be included as part of the quarterly Self-Monitoring Report.

f. Laboratory statements of results of analyses specified in Part B must be included in each report. The director of the laboratory whose name appears on the laboratory certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Board. The following information shall be provided:

i. The methods of analyses and detection limits must be appropriate for the expected concentrations. Specific methods of analyses must be identified. If methods other than EPA approved methods or Standard Methods are used, the exact methodology must be submitted for review; and,

ii. In addition to the results of the analyses, laboratory quality control/quality assurance (QA/QC) information must be included in the monitoring report. The laboratory QA/QC information should include the method, equipment and analytical detection limits; the recovery rates; an explanation for any recovery rate that is less than 80%; the results of equipment and method blanks; the results of spiked and surrogate samples; the frequency of quality control analysis; and the name and qualifications of the person(s) performing the analyses.

g. By March 31 of each year the discharger shall submit an annual report to the Board covering the previous calendar year. This report shall contain:

i. Tabular and graphical summaries of the monitoring data obtained during the previous year;

ii. A comprehensive discussion of the compliance record, and the corrective actions taken or planned which may be needed to bring the discharger into full compliance with the Site Cleanup Requirements; and,

iii. A written summary of the ground water analyses indicating any change in the quality of the ground water.

G. In the event the discharger violates of threatens to violate the conditions of the Waste discharge Requirement and prohibitions or intends to experience a plant bypass or treatment unit bypass due to:

1. Maintenance work, power failures, or breakdown of waste treatment equipment, or;
2. Accidents caused by human error or negligence, or;
3. Other causes, such as acts of nature.

The discharger shall notify the Regional Board office by telephone as soon as he or his agents

have knowledge of the incident and confirm this notification in writing within 7 working days of the telephone notification. The written report shall include time and date, duration and estimated volume of waste bypassed, method used in estimating volume and person notified of the incident. The report shall include pertinent information explaining reasons for the noncompliance and shall indicate what steps were taken to prevent the problem from recurring.

In addition, the waste discharger shall promptly accelerate his monitoring program to analyze the discharge at least once every day. Such daily analyses shall continue until bypassing stops or until such time as the Executive Officer determines to be appropriate. The results of such monitoring shall be included in the regular Self-Monitoring Report.

Part B

A. Description Of Observation Stations And Schedule Of Observations

1. The observation stations shall consist of the ground water monitoring wells and sludge / sediment monitoring locations in the vicinity of the waste management units. The siting and location and number of the observation stations shall comply with article 5 of chapter 15 as approved by the Executive Officer. Proposed observation station shall be included in the remediation plan for the WMUs.

2. The schedule of well observations and grab sampling shall be conducted quarterly within the months of January, April, July and October. At a minimum Sludge / sediment sampling shall be conducted annually.

B. Observations and Test Procedures

1. The ground water well observations shall consist of the following:

   a. Water elevation reported to the nearest 0.1 inch for both depth to water from the ground surface and the elevation of the ground water level;

   b. Ground water temperature measured at the time of sampling and reported in degrees Fahrenheit;

   c. Ground water electrical conductivity measured at the time of sampling as per Standard Methods 205 using potentiometric methodology;

   d. Ground water pH measured at the time of sampling as per Standard Methods 423 using potentiometric methodology; and,

   e. Ground water turbidity measured at the time of sampling.

2. The test procedures for the ground water samples and soil samples shall consist of the following:

   a. Volatile aromatic compound analysis using the EPA Method 5030/8020;

   b. Total dissolved solids using a gravimetric method;

   c. Total Petroleum Hydrocarbons and Fuel Hydrocarbons using the EPA Method 5030/8015 (Modified); and,

   d. Total Oil and Grease using Standard Methods 418.1, infrared analysis.

   e. Metals using EPA approved methods.

   f. Salinity, Alkalinity and chloride using standard approved methods

I, Steven R. Ritchie, Executive Officer, hereby certify that the foregoing Self-Monitoring Program is as follows:

1. Developed in accordance with the procedures set forth in this Board's Resolution No. 73-16;

2. Effective on the date shown below; and,

3. May be reviewed or modified at any time subsequent to the effective date, upon written notice from the Executive Officer, or request from the discharger.

June 15, 1994
Date Ordered

Steven R. Ritchie
Executive Officer